

Exorcising Natural Management



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The No-Analog Future

When shifting paradigms always remember to depress the clutch...

- Abandon historical ranges of variation as strict guides for management and restoration
- Facing the no-analog future: considering future ranges of variation
- Closely examine term “Natural” fire regime

Paradigm Shift

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SHORT COMMUNICATION

Abolishing virginity

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KEY WORDS: disturbance, forest ecology, old-growth, succession, tropical rainforest.

In forestry, virginity is relative. – Gary Hartshorn, *personal communication*.

In the last two decades a significant paradigm shift has occurred in the way ecologists describe and study temperate-zone forests. The attempt to define old-growth forests and to measure their structural and functional characteristics has led to substantial progress in the theoretical and practical understanding of these systems (Forman 1993). A similar shift is occurring in tropical

No-Analog Future

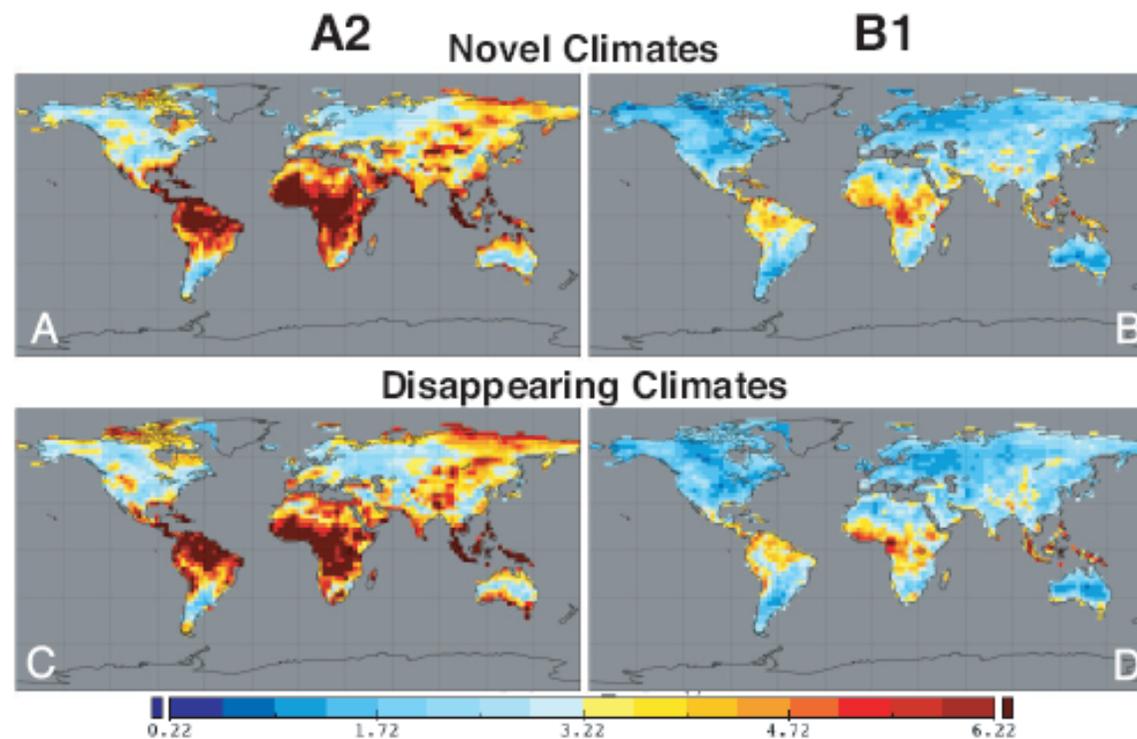
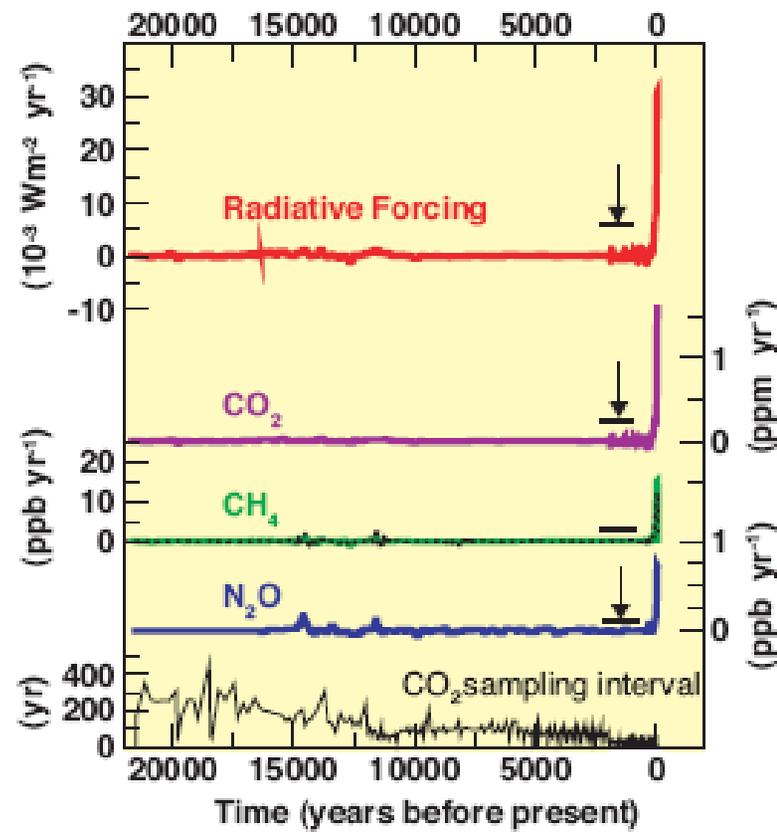


Fig. 3. A–D correspond to C–F in Fig. 1, except, here, the pool of potential analogs is restricted to gridpoints within 500 km of each target gridpoint. (A) SED_{\min} between the 21st-century realization for each gridpoint and the set of 20th-century climate realizations (A2 scenario). High dissimilarities indicate risk of regionally novel 21st-century climates. (B) As in A but for the B1 scenario. (C) SED_{\min} between the 20th-century realization for each gridpoint and the set of 21st-century climate realizations (A2 scenario). High dissimilarities indicate risk of regionally disappearing 20th-century climates. (D) As in C but for the B1 scenario.

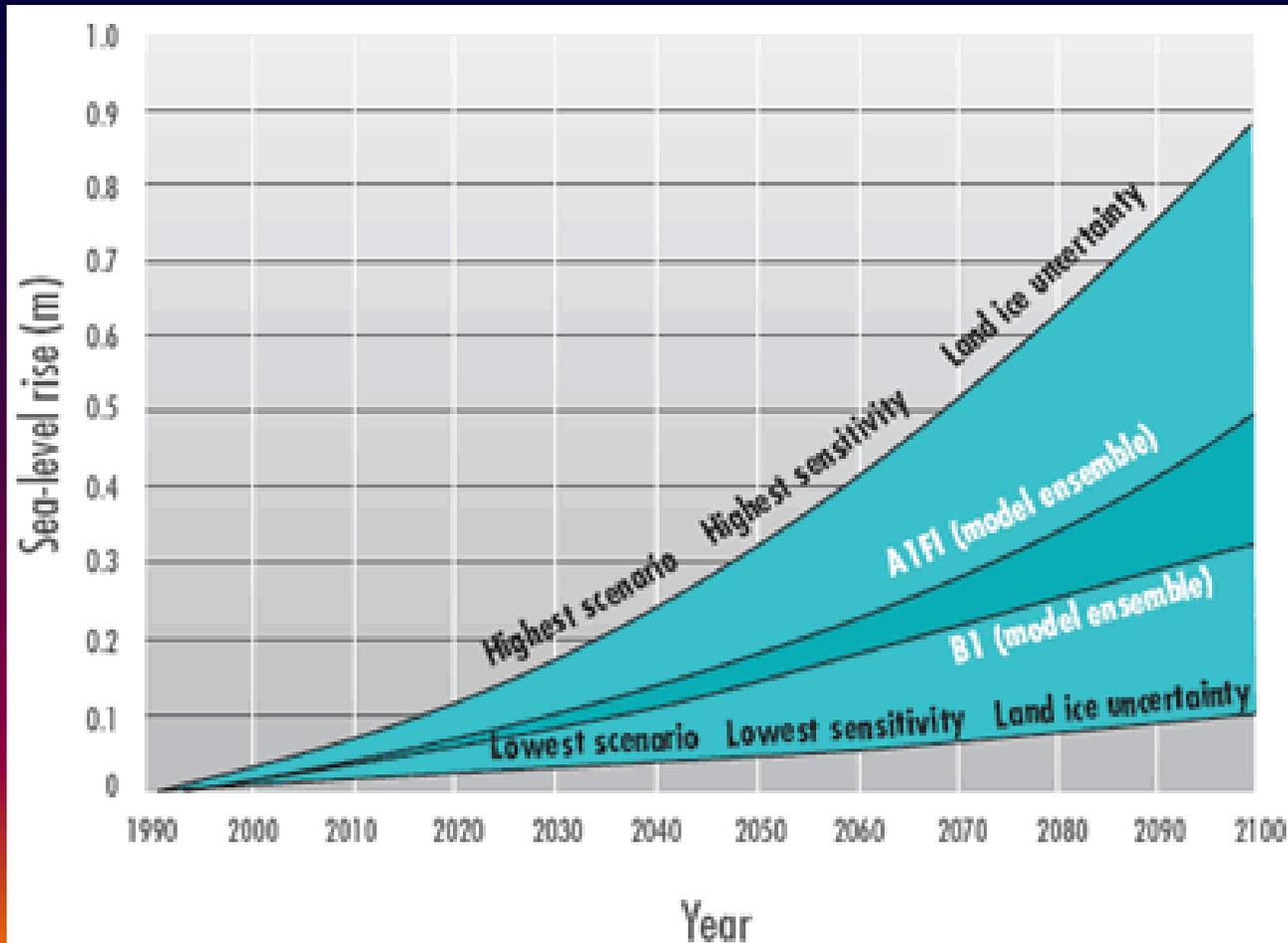
Unprecedented Rates of Change

Rates of change in natural and anthropogenic radiative forcing over the past 20,000 years

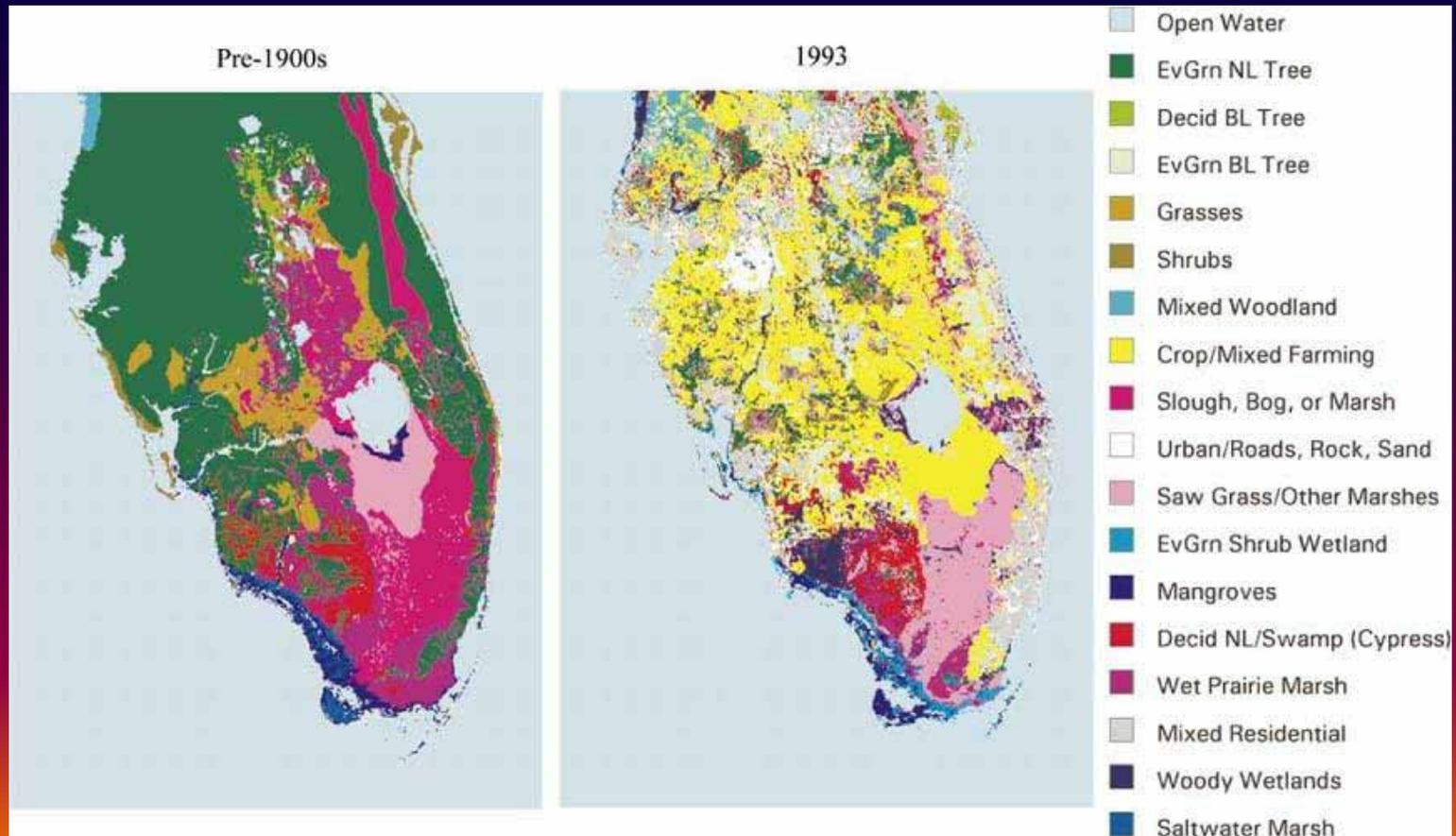
Fortunat Joos* and Renato Spahni†



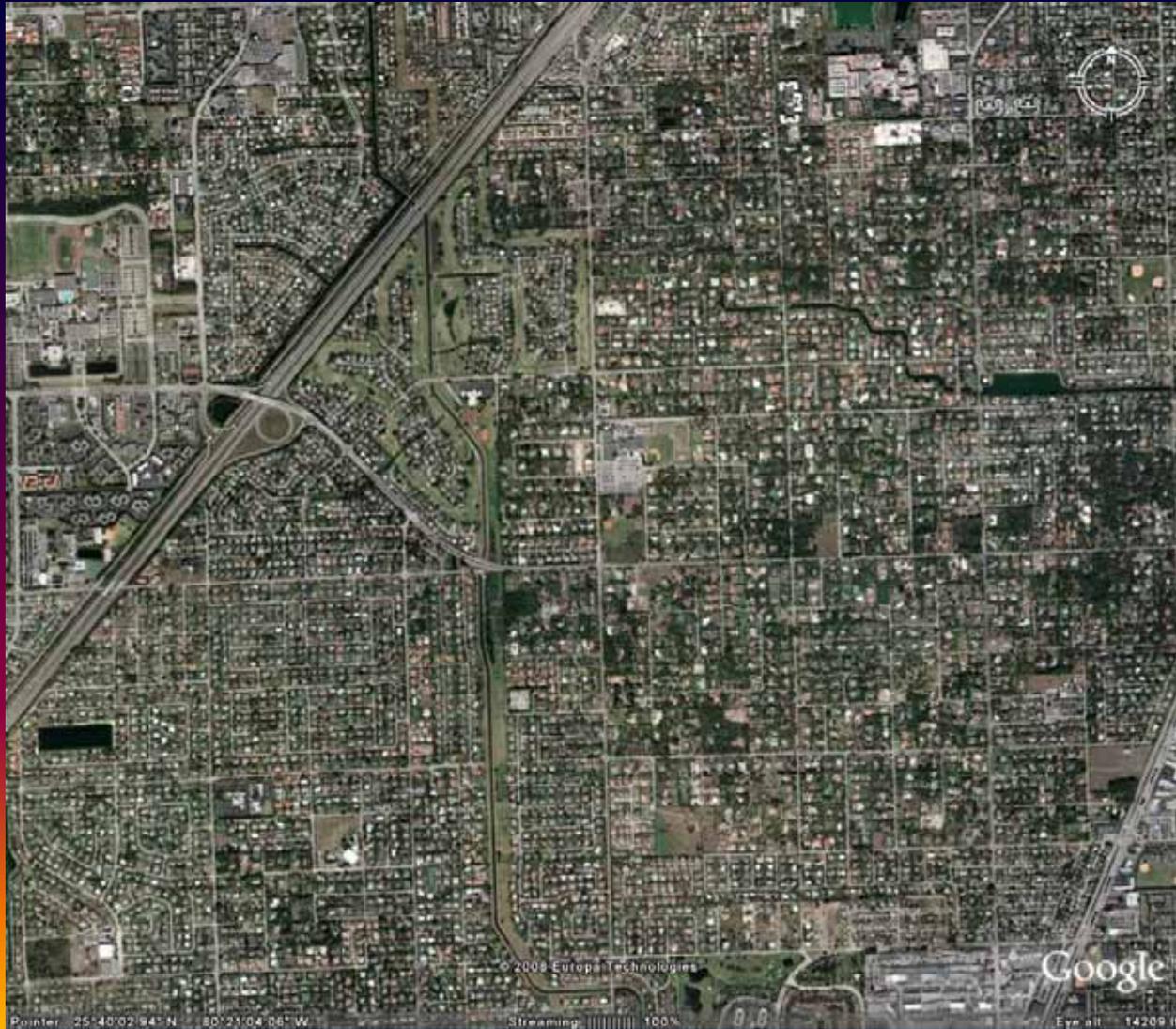
Sea Level Rise



Unprecedented Landscapes



Fragmentation

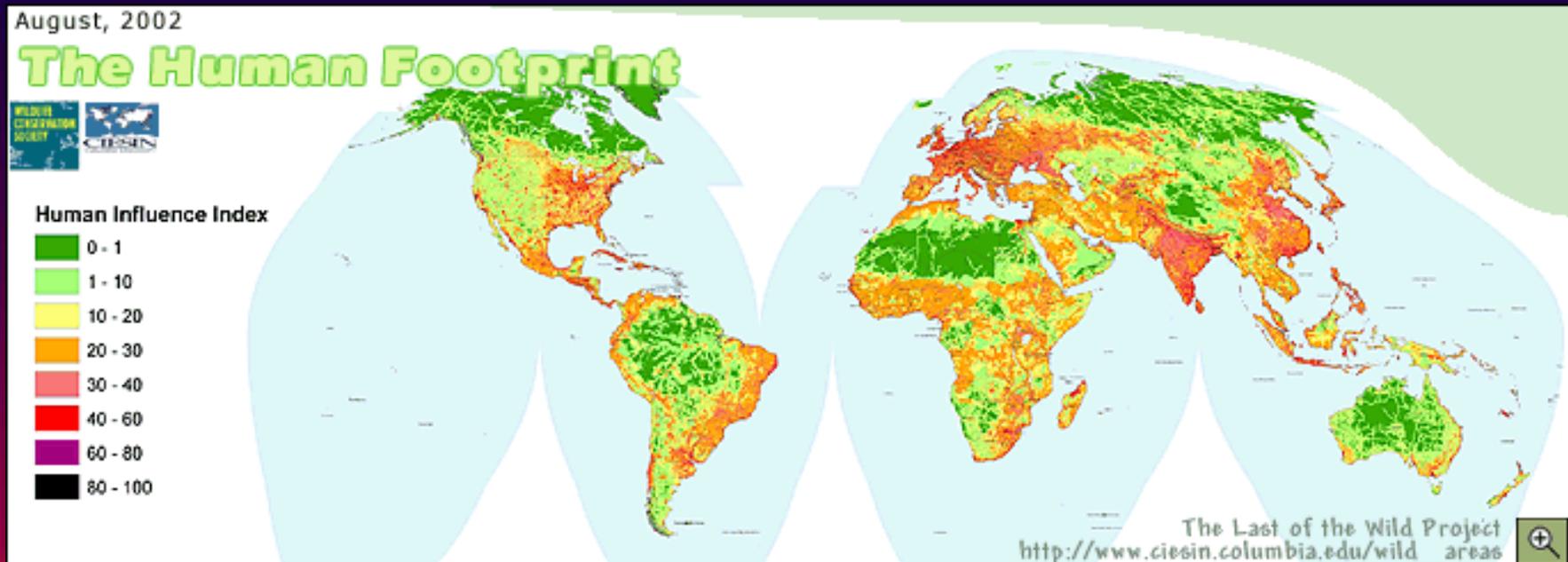


Introduced Species

- Pests
- Diseases



Welcome to the Anthropocene!



Zalasiewicz J, Williams M, Smith A, Barry TL, Coe AL, et al.
(2008) Are we now living in the Anthropocene? GSA Today:
Vol. 18, No. 2 pp. 4–8

Historical as Natural

- What is a natural fire regime?

Natural Fire

- Lightning ignitions (or volcanoes or meteorites)

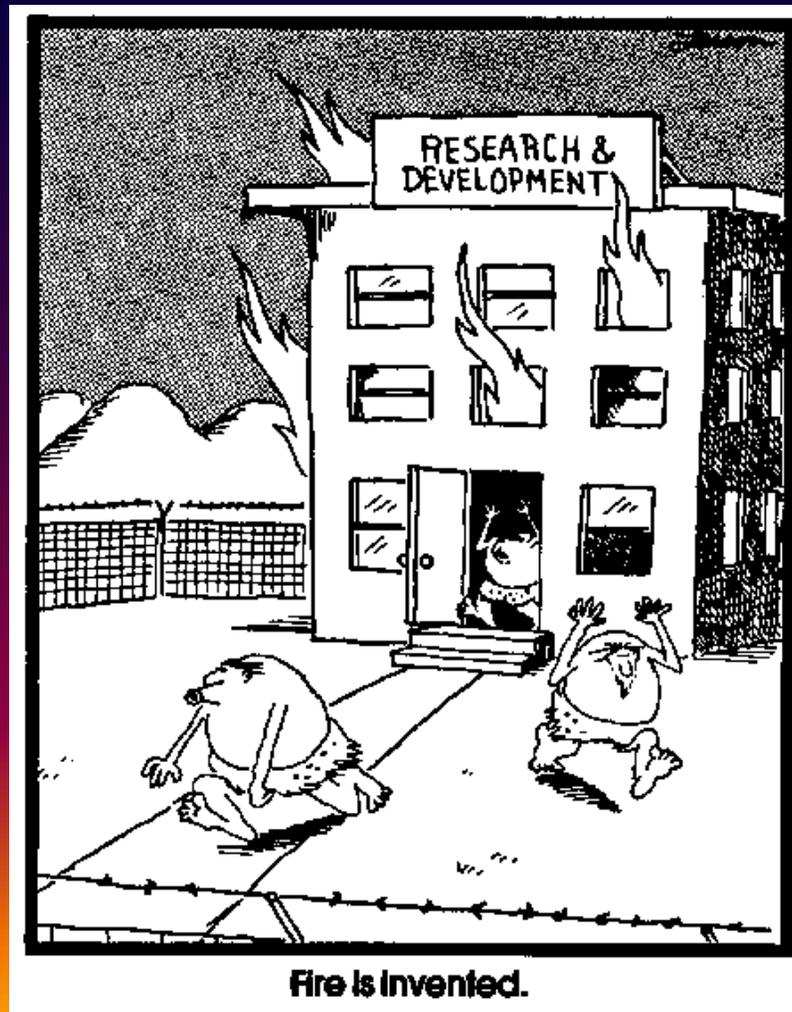


Is human fire use unnatural?



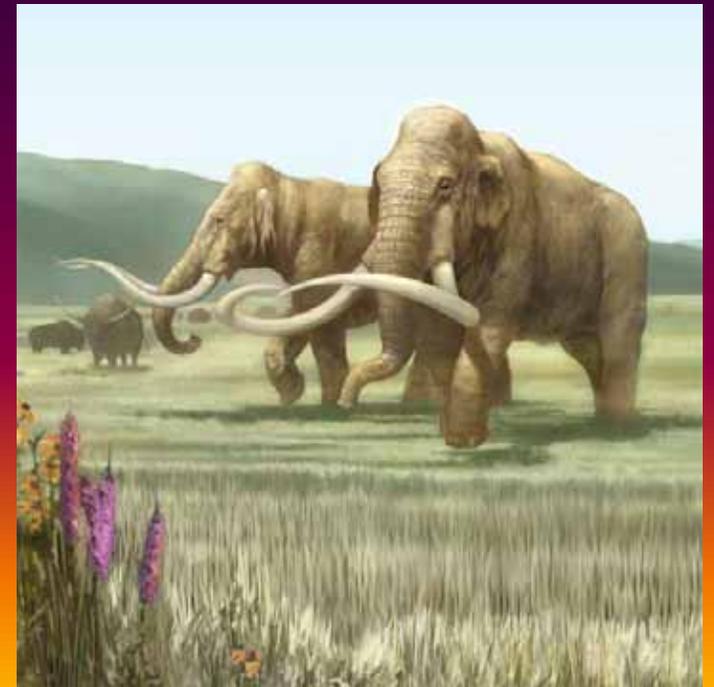
Homo erectus

Evidence of controlled use of fire 1.7 million years ago
(700,000 years ago undisputed)



Human fire use in North America

- Clovis Culture: 13,000 years old
 - Pre-Clovis: 15,000 years old



Extensive wildland fire use by subsequent cultures



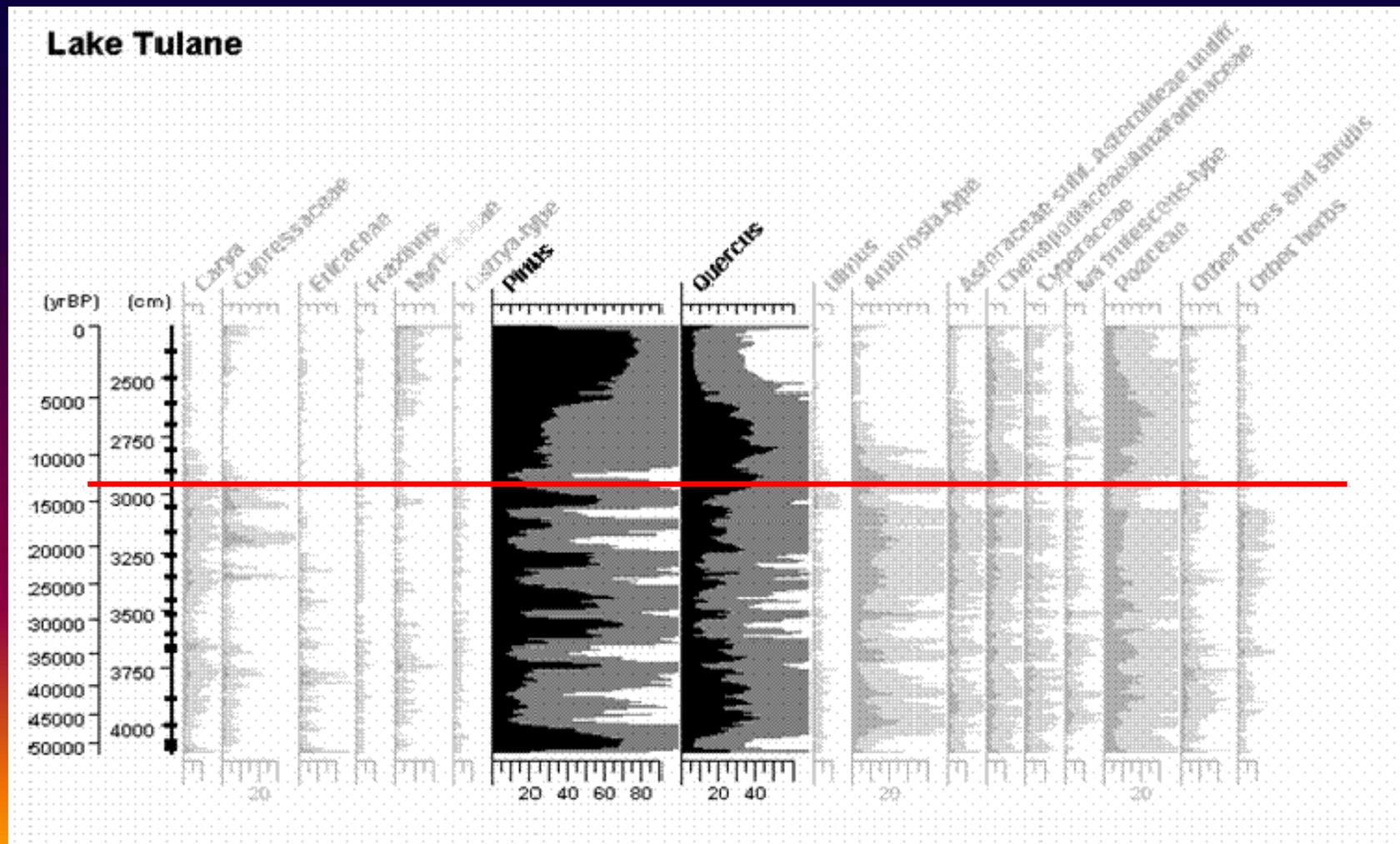
Continued by European colonists



“Natural” Fire

- At what point did human fire use become unnatural?

What point in the past should serve as our reference condition?



If it's pre-human then we must look back to the Pleistocene



The Anthropogenic Fire Regime is the Natural Fire Regime



“Unnatural” Fire

What is it about the recent historical landscape that is undesirable?



Abaco Old Growth
1950's



Dade Old Growth
1890's

Human Ignitions

- What proof is there that non-lightning season ignitions are detrimental?
 - How do we define detrimental?

What we know for sure...

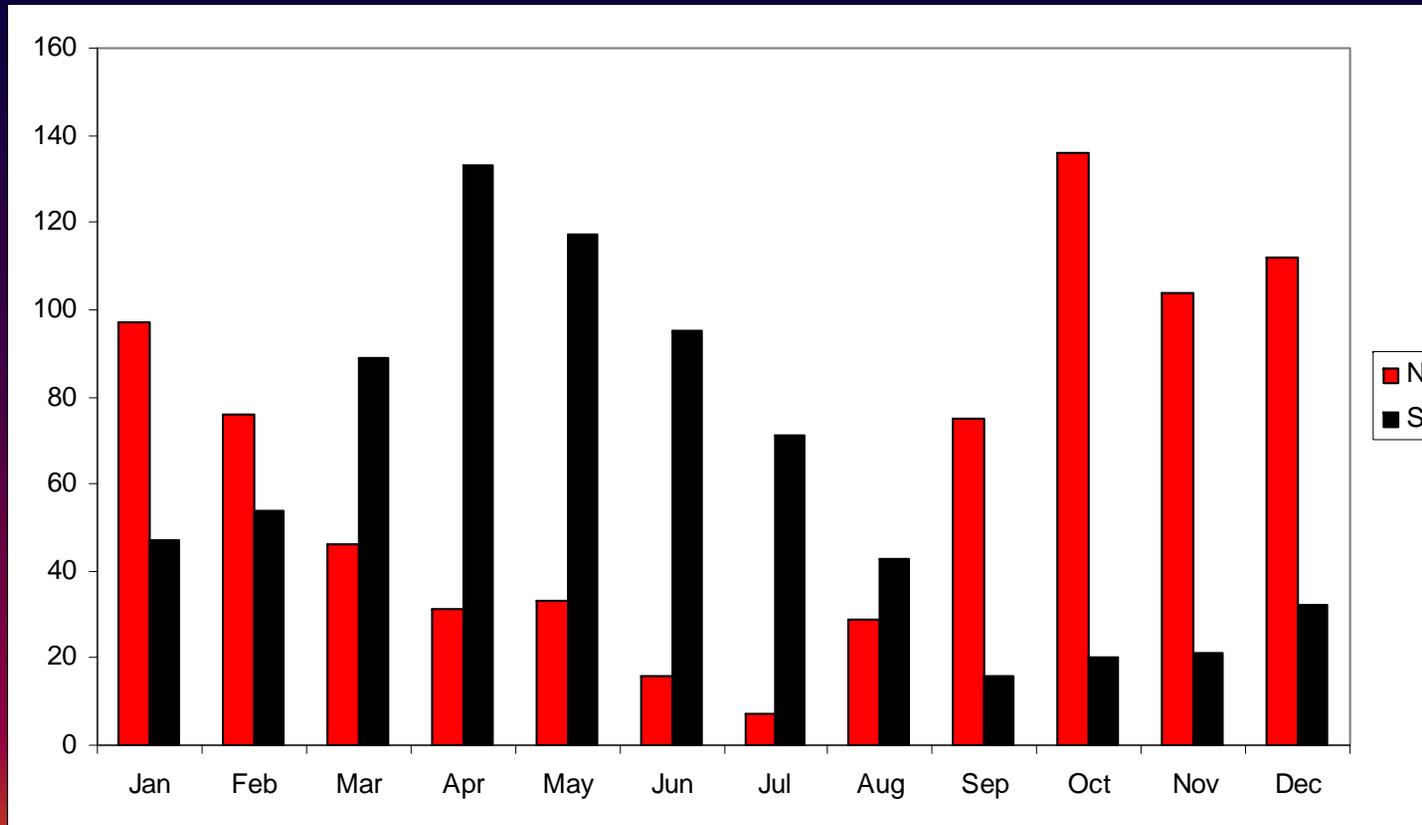
- Pine rocklands are fire dependent
- Fuel accumulations rates are rapid
- The landscape is fragmented
- The landscape has people in it

Impact of constraining the fire season

- Ecological Effects: poorly understood
 - Conflicting results to date, few long term studies
- Pragmatic Effects: well understood
 - Narrow prescription windows means less fire applied
 - Reduced fire frequency
 - Fuel accumulation
 - Loss of herbaceous plant diversity
 - Alternative stable states
 - Operational impacts
 - Predictability of fire weather
 - Smoke management

Prescription Windows

Burn Days per Year



Wind 5-15 mph
Humidity >15%
Temperature 0-120 F

Natural Management

The word “natural” is a poorly defined and diffuse management target

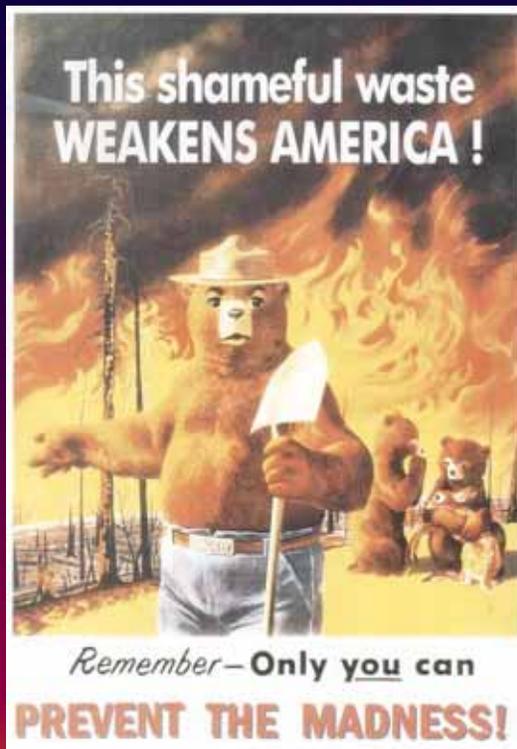
1. existing in or formed by nature (opposed to artificial): a natural bridge.
2. based on the state of things in nature; constituted by nature: Growth is a natural process.
3. of or pertaining to nature or the universe: natural beauty.
4. of, pertaining to, or occupied with the study of natural science: conducting natural experiments.
5. in a state of nature; uncultivated, as land.
6. growing spontaneously, without being planted or tended by human hand, as vegetation.
7. having undergone little or no processing and containing no chemical additives: natural food; natural ingredients. Compare organic (def. 11).
8. having a real or physical existence, as opposed to one that is spiritual, intellectual, fictitious, etc.
9. of, pertaining to, or proper to the nature or essential constitution: natural ability.
10. proper to the circumstances of the case: a natural result of his greed.
11. free from affectation or constraint: a natural manner.
12. arising easily or spontaneously: a natural courtesy to strangers.
13. consonant with the nature or character of.
14. in accordance with the nature of things: It was natural that he should hit back.
15. based upon the innate moral feeling of humankind: natural justice.
16. in conformity with the ordinary course of nature; not unusual or exceptional.
17. happening in the ordinary or usual course of things, without the intervention of accident, violence, etc.
18. related only by birth; of no legal relationship; illegitimate: a natural son.
19. related by blood rather than by adoption.
20. based on what is learned from nature rather than on revelation.
21. true to or closely imitating nature: a natural representation.
22. unenlightened or unregenerate: the natural man.
23. being such by nature; born such: a natural fool.

The “natural” fire regime is an anthropogenic fire regime

Future Ranges of Variation

- Management by objective:
 - Maximize biodiversity, minimize wildfire risk, aesthetics, pine regeneration?
- Pragmatism:
 - Burn in any season as a hedge against various tradeoffs
 - Frequency trumps seasonality
 - Managers:
 - Keep burns variable, monitor and adapt
- Knowledge gaps
 - Decouple burn severity from seasonality
 - Make valid comparisons (not arson vs prescribed fire)
 - Understand tradeoffs among fire effects on recruitment, mortality and phenology

A more sophisticated management philosophy will be required...



ONLY YOU

THE SCIENCE OF WILDFIRE | GOOD FIRES / BAD FIRES | FIGHTING FIRES | PREVENTION

Prescribed Fires | It Could Be You

GOOD FIRES

Although the chemical reaction known as fire is inherently neither good nor bad, the circumstances surrounding its ignition, its burn rate, its location, and its intensity are.

Prescribed Fires are Good Fires.

As one of the most important natural agents of change, fire plays a vital role in maintaining healthy ecosystems. Prescribed fire reintroduces the beneficial effects of fire into an ecosystem, producing the kinds of vegetation and landscapes we want, and reducing the hazard of catastrophic wildfire caused by excessive fuel buildup. [Learn More about Prescribed Fire](#)

BAD FIRES

Wildfires are Bad Fires.

They destroy wilderness, property, and lives. As more homes are built in and around forested areas, and as more people take to our country's wildland areas, wildfires are also on the rise. Through discarded smoking products, sparks from equipment in operation, arson, powerlines, campfires, arson, debris burning and other careless means, wildfires are often ignited, and its fires such as these - unplanned, uncontrolled and unnecessary - that could be most easily prevented. [Learn More](#)

FIRE OUTLOOK

- USDA Forest Service - Wildland Fire Use**
Wildland fire management, its history, and reasons for its use.
- The Forest History Society**
Detailing the history of interaction between people and the forests that surround them.
- Wildland Fire in Yellowstone**
Learn about the natural effects of fire on Yellowstone's ecosystem.
- About Forestry**
Fire's ongoing role in our forest's natural ecosystem.
- NOVA - Fire Wars**
How plants and other living organisms use fire.

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ONLY YOU CAN PREVENT WILDFIRES.